EXERCÍCIO 1

$$Maximize\ Z = 2x_1 + x_2,$$

Subject to:
$x_1 + 2x_2 \leq 10,$
$x_1 + x_2 \leq 6,$
$x_1 - x_2 \leq 2,$
$x_1 - 2x_2 \leq 1,$
$x_1, x_2 \geq 0$

[Dayalbagh Edu. Inst. Agra Dec., 2006; P.U.B.E. (E. and Ec.) 1994; B.E. (Elect.) Oct., 1993; B. Com. Sept. 2004]

EXERCÍCIO 2

$$Minimize\ Z = -x_1 + 2x_2,$$

Subject to:
$-x_1 + 3x_2 \leq 10,$
$x_1 + x_2 \leq 6,$
$x_1 - x_2 \leq 2,$
$x_1 - 2x_2 \leq 2,$
$x_1, x_2 \geq 0$

[Roorkee M. Sc. (Appl. Math.) 1973]

EXERCÍCIO 3

$$Maximize\ Z = -x_1 + 2x_2,$$

Subject to:
$x_1 - x_2 \leq -1,$
$-0.5x_1 + x_2 \leq 2,$
$x_1, x_2 \geq 0$

[P.U.B. Com. April, 2007; Sept., 2006; B.E. (C.S. and E.) Dec., 2004]

EXERCÍCIO 4

$$Maximize\ Z = 5x_1 + 4x_2,$$

$$Subject\ to:$$
$$x_1 - 2x_2 \leq 1,$$
$$x_1 + 2x_2 \geq 3,$$
$$x_1, x_2 \geq 0$$

[P.U.B. Com. April, 2008; P.T.U.B.E. 2001]

EXERCÍCIO 5

$$Maximize\ Z = 3x + 2y,$$

$$Subject\ to:$$
$$-2x + 3y \leq 9,$$
$$3x - 2y \leq -20,$$
$$x, y \geq 0$$

[P.T.U. M.B.A. May, 2002; P.U.B. Com. April, 2006; B.E. (Elect.) 1996]

EXERCÍCIO 6

Example 2.44. *Find the maximum value of*

$$Z = 2x_1 + 3x_2,$$
$$subject\ to\ x_1 + x_2 \leq 30,$$
$$x_2 \geq 3,$$
$$x_2 \leq 12,$$
$$x_1 - x_2 \geq 0,$$
$$0 \leq x_1 \leq 20.$$

[P.U.B.E. (Mech.) May, 1983; P.T.U. (B.Tech.) 2001; Nellore M.B.A. 2002]

EXERCÍCIO 7

Example 2.54. *A firm uses lathes, milling machines and grinding machines to produce two machine parts. Table 2.16 represents the machining times required for each part, the machining times available on different machines and the profit on each machine part.*

Table 2.16

Type of machine	*Machining time required for the machine part (minutes)*		*Maximum time available per week (minutes)*
	I	*II*	
Lathes	*12*	*6*	*3,000*
Milling machines	*4*	*10*	*2,000*
Grinding machines	*2*	*3*	*900*
Profit per unit	*Rs. 40*	*Rs. 100*	

Find the number of parts I and II to be manufatured per week to maximize the profit.